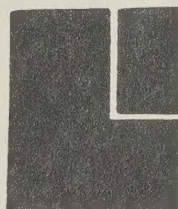


**The Regional Municipality of Hamilton-Wentworth
The Corporation of the City of Hamilton
The Hamilton Public Library Board**

**Information Systems Requirements Study
and
Review of
Related Technical and Management Issues**

October 1985

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A REPORT FOR
THE HAMILTON GOVERNMENT GROUP

Comprised of
THE REGIONAL MUNICIPALITY OF
HAMILTON-WENTWORTH


THE CORPORATION OF
THE CITY OF HAMILTON

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October 9, 1985

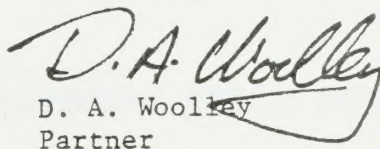
Mr. J. Thoms
Chairman
Information Systems Requirement Study
Steering Committee
Commissioner of Planning and Development
The Regional Municipality of Hamilton-
Wentworth
14th Floor
Ellen Fairclough Building
71 Main Street West
Hamilton, Ontario
L8N 3T4

Dear Mr. Thoms:

We are pleased to submit our draft report entitled "Information Systems Requirements Study and Review of Related Technical and Management Issues". The report contains the findings and conclusions reached during our study of the organizations in the Hamilton Government Group.

We look forward to discussing our report with you and the Hamilton Government Group during the next few weeks.

Yours very truly,
PEAT, MARWICK and PARTNERS


D. A. Woolley
Partner



THE HAMILTON GOVERNMENT GROUP
INFORMATION SYSTEMS REQUIREMENTS STUDY
AND REVIEW OF RELATED TECHNICAL
AND MANAGEMENT ISSUES

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THE HAMILTON GOVERNMENT GROUP
INFORMATION SYSTEMS REQUIREMENTS STUDY
AND REVIEW OF RELATED TECHNICAL
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EXECUTIVE SUMMARY



EXECUTIVE SUMMARY

This report presents the results of a review of the information systems resources and future application requirements of the Regional Municipality of Hamilton-Wentworth, the City of Hamilton and the Hamilton Public Library (referred to collectively in this report as the Hamilton Government Group or HGG). The review is the first phase of a process that will result in the development of a comprehensive information systems plan for your organizations.

In performing this study we reached a number of conclusions which are identified below and discussed in detail in the report. These 16 key conclusions will become issues for analysis and resolution during the next phase of the study.

1. Your managers have identified requirements for more than 130 new or upgraded computerized systems. These systems range in scope from personal productivity tools to major corporate systems.
2. Included in these 130 plus applications are four classes of systems that will have a significant impact on both the user departments and the resources of the systems functions at both the City and the Region. These four major groups include integrated office systems, property systems, human resources, and financial systems. The office systems in particular will demand a heavy investment in upgraded central hardware, network facilities, workstations, training, organization and procedure redesign, and software development.
3. There is a high level of awareness of the ways that automation can help departments fulfill their mandates. Thus, resistance to the introduction of automation is not likely to be an issue at the management level.
4. The majority of the new or upgraded system requests can be applied in all three organizations. This suggests that many of the new systems could be co-developed.
5. Many of your existing systems are approaching technical and functional obsolescence and will have to be replaced in the next few years, creating an opportunity to develop integrated systems for use by many departments.
6. Major opportunities for improved management control and increased productivity, through the use of automation, exist in several departments.
7. Several departments, such as Planning and Transportation (Transit), have developed sophisticated systems using their own resources.
8. Current systems, such as the Planning Department's industrial database, have the potential to become foundations for many of the newly identified requirements. These systems will require additional funding and technical support to produce the potential benefits.



9. Large departments, such as the Fire Department, Transportation and the Library, have specialized requirements that cannot be met within the existing structure of your central systems facilities and/or support organizations.
10. The Library and the Region do not receive adequate support or service from the City's Systems and Data Processing Department . On the other hand, they are not currently paying enough to cover the cost of providing the facilities they use. The true value of these services needs to be established in a competitive and equitable manner.
11. It currently is not possible to measure objectively service levels provided to users.
12. There is only limited evidence of long-range planning for information systems.
13. The Region's systems committee, REMIC, is an excellent vehicle for coordinating systems requirements and priorities.
14. The systems departments at both the Region and the City have a good base of personnel, but some retraining and the hiring of several highly specialized planners and technicians are required.
15. Additional attention should be given to disaster planning and security issues.
16. A functional and uniform systems development and project management methodology does not exist in either the City or the Region.

We have reviewed your requirements from a number of perspectives. Chapter 2 summarizes the inventory of more than 130 new or upgraded applications that we have developed. Appendices A to C contain further details on each of these projects. This inventory identifies opportunities to share resources productively. However, we highlight in Chapter 3 several challenges that must be faced and overcome, regardless of whether these systems are developed on a shared or on an independent basis.

The next phase will develop a strategy to help your three organizations achieve your systems projects in the most effective manner. It will also address the challenges raised in Chapter 3, such as systems development methods and standards, service levels, and the cost recovery of system services.

We wish to acknowledge the contribution made to this study by the Engagement Steering Committee. The assistance provided by Mr. Jim Hindson was particularly valuable and greatly facilitated the performance of our work. We also appreciate the cooperation we received from all staff members in your organizations.



CHAPTER 1

INTRODUCTION



1 - INTRODUCTION

This report presents the results of a review of the information systems resources and requirements of the Regional Municipality of Hamilton-Wentworth, the Corporation of the City of Hamilton and the Hamilton Public Library Board. In this chapter, we review the background to the study, its scope, and the approach we followed in completing this assignment.

BACKGROUND

In October 1983, recommendations for the creation of a Municipal Information Centre (MIC) were submitted to the Region and City Finance Committees and the Hamilton Library Board. The proposed centre was to be a jointly managed utility on a user-fee basis. It would service any member of the Hamilton Government Group and possibly other area municipalities, boards and commissions. The proposed facility would be responsible for all equipment and data processing personnel, regardless of current ownership or reporting relationships. The MIC would be managed by one director who would report to a committee consisting of representatives of all user organizations. Although the MIC has not yet been formally established, considerable sharing of resources currently takes place within the HGG.

STUDY OBJECTIVES AND SCOPE

As a first phase in the development of a strategy for your three organizations, Peat Marwick was engaged in July 1985 to:

- develop a current inventory of information systems resources and requirements of the Hamilton Government Group,
- express opinions on a number of specific issues relating to the development of information systems and the delivery of systems services.

The study did not include an evaluation of the concept of the Municipal Information Centre. Similarly, we were not asked to review alternative technical structures, application architectures or implementation strategies.

This requirements study was primarily concerned with gathering the facts required to identify and evaluate options available to the Hamilton Government Group for optimizing the effectiveness of your information systems resources. Subsequent phases will draw upon this information and produce firm recommendations and detailed implementation strategies.



Several resource inventories have been prepared over the past three years by members of the HGG. During the conduct of this study we attempted to consolidate the previous documents and to update them to reflect current plans. As explained in the main body of this report, the lists that we have prepared can be considered representative but not necessarily exhaustive.

A challenge faced by the consulting team was development of a list of resources and requirements that could be considered "current". During the three-month duration of the study, changes were made to existing systems and equipment allocations. We are aware that in some instances the report may be dated. For planning purposes, however, we believe that the list of resources and requirements is valid.

The requirements inventory serves a number of purposes:

- it identifies requirements for new or upgraded information systems,
- it serves as a planning base for implementation of the MIC through identification of complementary and conflicting user and technical requirements,
- it highlights opportunities to share existing resources among users with similar requirements,
- it provides an opportunity to reduce systems development and operational costs and improve the value of new systems by combining proposed projects that share common users or information resources,
- it identifies unique departmental requirements that cannot be satisfied by corporate systems initiatives, and
- it assists management in identifying organizational implications and the resources required to implement and operate effective information systems.

The Executives of the HGG are committed to increasing the effectiveness of their use of systems technology. The MIC is seen as a vehicle that will help achieve this objective. Before any amalgamation can occur, it will be necessary to establish standards relating to service levels, user fees, development methodologies, and security and to resolve a number of other management issues. We have reviewed several of these issues with the objectives of:

- comparing existing standards and procedures with those considered generally acceptable by government and private sector organizations,
- identifying specific changes or enhancements that will be required before the MIC is implemented.



ENGAGEMENT APPROACH

As described above, this engagement was essentially a fact-gathering exercise that will provide input to future phases of your long-range systems planning and strategies. Our work program consisted of the following steps.

Review of Background Material

We collected and reviewed a large amount of background data relating to the current facilities, systems, plans and operating procedures of all three organizations. The information we reviewed included budgets, current system documentation, organization charts and position descriptions, equipment and software lists, utilization statistics, published and informal standards and procedures, current work assignments, schedules, priority lists and status reports.

Systems Planning Workshops

We held full-day planning workshops for senior officers of each of the three organizations. These workshops provided us with valuable information regarding the plans and needs of all of the key HGG departments. We also obtained input as to the concerns a number of departments share: particularly their concerns about service levels, autonomy and the priority-setting process.

Following the corporate-level workshops, seven cross-organizational sessions were held for middle management personnel. These workshops were hosted by the Engagement Steering Committee under the guidance of Mr. James Hindson, the Study Coordinator. They focused on common systems requirements such as property-based, human resource or financial systems.

Although Peat Marwick did not participate directly in these sessions, we have reviewed the report prepared by Mr. Hindson and, where possible, have incorporated the results into our findings.

Individual Department Interviews

A team of consultants performed individual interviews with representatives of all operating departments in the HGG. Each interview was from one to three hours in duration. In some cases, we met with officials individually. In other cases, we conducted mini-workshops for groups of managers, for example with Social Services and Transportation.

The objectives of the individual interviews were to determine how satisfied departments are with existing systems and to identify any plans for future automation. As might be expected, the information we were able to obtain varied greatly in depth from interview to



interview. In some cases, such as the Traffic Department, there was a well-defined list of requirements. In others, the officials could see no need for automation.

Consultant Workshops

Following completion of the engagement field work, the consulting team held three planning and analytical sessions to review the interview results and consolidate the background material.

As a result of these workshops, we performed a number of confirmation interviews to validate our conclusions and, where necessary, to gather additional information.

Steering Committee Meetings

Throughout the engagement, close contact was maintained with a Steering Committee composed of:

- Mr. J. Thoms, Commissioner of Planning and Development, (Region),
- Mr. E. Matthews, City Treasurer, (City),
- Ms. B. Zommers, Coordinator of Automated Systems, (Library), and
- Mr. J. Hindson, Manager of Operations, Traffic Department, (City and Study Coordinator).

At a number of formal and informal meetings, we reviewed progress, outlined any concerns or issues and sought any clarification that was required.

We also met with each of the chief executives of the HGG on two occasions to obtain their input and views as to the focus of the study.

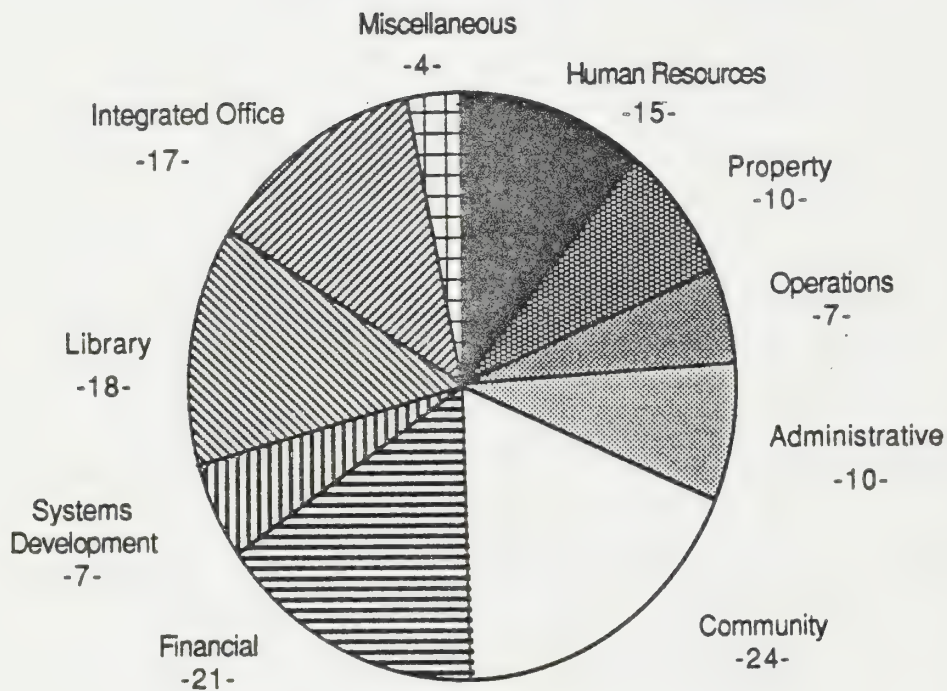
The next two chapters of this report present our findings and conclusions on the various systems projects required by your users, as well as the results of the management and technical issues review.



CHAPTER 2

SUMMARY OF REQUIREMENTS

EXHIBIT 2-1
DISTRIBUTION OF APPLICATIONS BY CLASS



TOTAL - 133 PROJECTS

NOTE: The numbers below each application class represent the number of specific projects in that class. See Appendix C for a brief description of each of the projects.



2 - SUMMARY OF REQUIREMENTS

In this section, we present our general observations and conclusions from compiling the requirements inventory. (The inventory listing is presented in a series of tables in Appendices A to C of this report.) At the end of this chapter we discuss the implications for management of our conclusions.

GENERAL OBSERVATIONS AND CONCLUSIONS

We have summarized our observations and conclusions regarding your requirements under the following headings:

- o Potential Application Backlog
- o Scope of Potential Applications
- o User Department Sophistication
- o Application Obsolescence
- o Major Opportunities
- o Application Duplication
- o Foundation Systems
- o Specialized Departmental Systems.

Potential Application Backlog

During the study, more than 130 potential applications were identified by managers in the various HGG departments. Appendix C contains a broad description of each of these projects. The applications range in complexity from simple personal productivity tools to highly complex corporate systems.

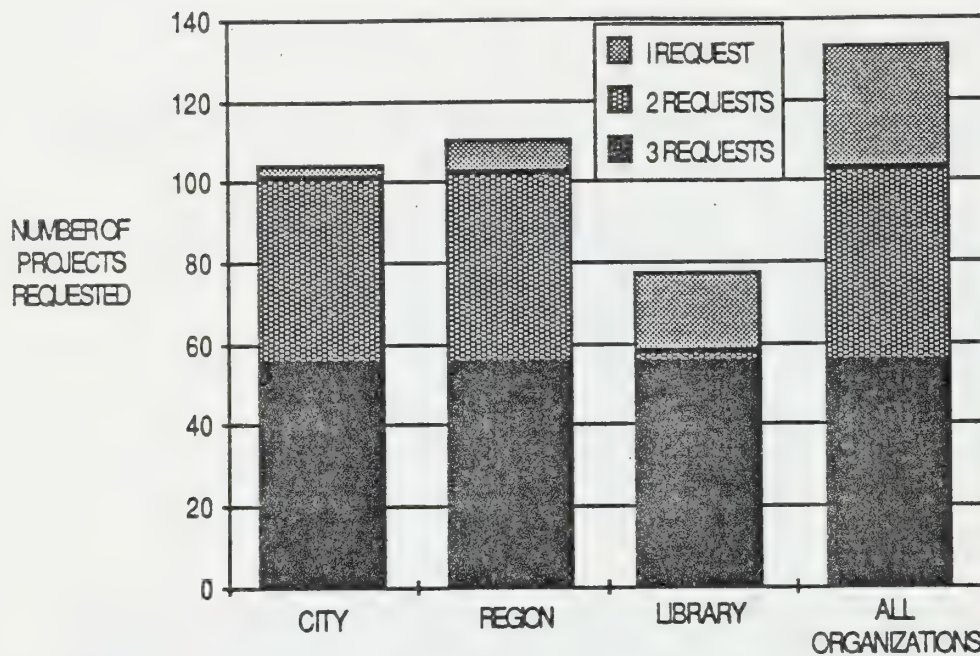
We have not attempted to quantify the costs or benefits associated with the proposed systems, although Appendix B identifies the potential benefits on a preliminary basis. Nor have we attempted to estimate the resources required for their development and ongoing operation. However, if only 50% of the identified needs proved justifiable, the present development and computing resources of the HGG would be overwhelmed for many years.

Exhibit 2-1, overleaf, depicts the distribution of the applications, categorized into 10 major classes or groups. Of these classes, four will require particular attention in the strategy phase:

- Integrated office systems (IOS or office automation) because of the investments required in hardware (including upgraded central computers and workstations), network facilities, software development, and training. With IOS projects, it is essential to your success to address the complementary operational infrastructure issues (e.g.,

EXHIBIT 2-2

APPLICATIONS REQUESTED BY EACH ORGANIZATION



NUMBER OF REQUESTS	SUMMARY OF REQUESTS BY ORGANIZATION			
1 REQUEST	3	8	19	30
2 REQUESTS	46	47	3	48
3 REQUESTS	55	55	55	55
TOTAL	104	110	77	133

NOTE: The shading of the chart depicts the number of organizations that requested each of the projects identified in Appendix A:

- 1 Request = only one organization requested the project
- 2 Requests = two organizations requested the project
- 3 Requests = all three organizations requested the project.



organization redesign; new policies/standards for data administration, security, systems development and acquisition; job retraining and career counselling; central and local support).

The resolution of these infrastructure issues are critical if IOS facilities are to be widely accepted and used in the organization **by all users** -- not just the early adopters of technology. For end-user systems to work well, information and data bases should be as accessible as electricity, and the systems should be as easy to use as a modern home appliance. **This kind of information utility concept will not just happen -- it must be planned and managed by all the affected parties: senior management, system professionals, users including elected officials.**

- The property systems, because of the wide variety of users who want to be able to share and extend the information contained in both the Region's and the City's property data bases. Further, challenges to sharing will arise with the development of package software and special hardware designed to handle geo-coded data, digitizing/plotting maps, and workstations with different graphics capabilities.
- The human resource systems because of the complexity of the benefits administration with a wide variety of plans and union contracts. Your diverse needs will be a challenge for any package or systems developer and will require a significant investment to implement a comprehensive system if it is to be used by all major users.
- The financial systems because of the number of users who are anxious to have tighter control and online access to their purchasing and financial data. Already several users either have an informal system or plan to build one if a more timely and complete corporate system is not implemented soon.

Scope of Potential Applications

Many of the potential applications are corporate in scope. A corporate application is defined as one that at least three departments have identified as a high priority.

Based on estimated processing requirements and the number of departments requesting new systems, it is possible to predict that current equipment will have to be extensively upgraded in the next few years. The extent of the upgrade will be estimated during the next phase of the study as the requirements list is rationalized and the strategy is developed.



Exhibit 2-2, opposite, depicts the number of systems requested by the Region, the City, and the Library. The distribution indicates a high degree of overlap in the systems being requested. Of the 132 projects, 55 are requested by all three organizations. In appendix A, you will find that there are an additional 48 projects that are wanted by at least two organizations in the group. This suggests that many opportunities to co-develop new applications exist.

User Department Sophistication

We found a high level of awareness of advanced systems concepts in many user departments. The systems being requested are typically online, database applications rather than traditional batch-processing, sequential-file systems.

We also encountered a strong demand for personal productivity tools and local processing power. It is apparent that many management personnel are aware of the need to improve productivity and the role that can be played by automation in achieving their goals.

Application Obsolescence

Several of HGG's present major systems are becoming technically obsolete. An example is the City of Hamilton's general ledger system which is a "patchwork quilt" of modern, packaged software and custom programs that are 10 to 15 years old. Systems such as the financial accounting, taxes and human resource-related applications will require replacement within the next 3-5 years or sooner, if major enhancements or large-scale integration of applications are planned.

We have not performed a detailed evaluation of the existing applications. Based on our experience, however, we would suggest that more than half of all applications currently used in the HGG are either at or approaching the point of being serious candidates for replacement.

Major Opportunities

A number of outstanding opportunities exist to improve management control and productivity. The benefits associated with these systems can be realized quickly with little impact on the data processing function's workload.

The Social Services Department - Homes for the Aged Division offers one such opportunity. The Regional homes are in many ways analogous to hospitals. Yet, unlike modern hospitals, virtually no automation has been applied to their administration. There are a number of good systems available for automating functions such as:

- admissions and patient records management,
- nurse and staff scheduling,
- dietary and pharmacy order processing and management, and
- physical inventory, asset control and financial management.



Several of these systems are offered by their developers as "turnkey" applications which will operate on HGG's existing hardware.

Application Duplication

Many applications are being requested by departments in all three organizations. Although some data and reporting requirements may be unique, most systems share a core of common functions and data elements which are common. Examples of requests for new systems that could be co-developed include all of the human resources, purchasing, land-based property, financial reporting and budget preparation, inventory control, Clerk's and Legal Department systems.

HGG's executives have identified several opportunities for amalgamating their administrations. In our view, departments slated for amalgamation should receive high priority for new systems initiatives. The combined departments should be provided with the tools required to achieve the productivity objectives that led to their merger.

Foundation Systems

HGG has purchased and developed a number of software applications that could become "foundations" for the future breed of integrated systems. Some of these are successes; others have not lived up to their potential.

Many of the new requirements identified during this study relate to property-based information. The Regional Planning Department has developed a system which could become a foundation for all property-related systems. In order to realize the benefits that could accrue from sharing the Planning Department's existing software and data bases with other departments that require land-related information (Engineering, Fire, Clerk's, Building, etc.), more funds and human resources will have to be invested in the short term. These investments will include the enhancements required to the data base, software and hardware (e.g., linking ancillary department data bases - Fire, Engineering, Property, etc. - to the assessment and planning files, a new tax assessment and billing system, workstations to display property information graphically, etc.). The benefits to be gained from an integrated property information system should outweigh the short-term investment required.

Specialized Departmental Systems

Several major departments have systems requirements that are unique and cannot be satisfied within the framework of the existing City or Regional centralized data processing installations and/or support organizations. These include:

- o the Fire Department, which requires 24-hour, 365 days-a-year processing to support a computer-assisted dispatch system,



- o the Transportation (Transit) Department, which has unique, interactive systems that are not suited to the IBM or Wang technologies,
- o the Library, which is the largest user of computing resources in the HGG, requires more systems support and computing power than is currently provided by the City.

The ability of these departments to fulfill their mandates is directly linked to their having satisfactory automated systems and support. The Transportation Department is currently self-sufficient. The Library and Fire Department are totally dependent on the City's Systems and Data Processing Department.

Because of its size and complexity, the Library merits additional discussion in this report.

The Library's major computer system is DOBIS, a proprietary software system purchased through IBM. DOBIS controls the circulation of library material, and maintains and provides access to the catalogue. At present, several additional DOBIS subsystems are available to the Library, but they have not been installed (e.g., acquisitions, public access, etc. See Appendix C, class 8.00 - Library Systems for details.).

The City's Systems and Data Processing Department is responsible for the maintenance of DOBIS. However, even though the Library currently uses almost half of the City's total computing power, it is allocated only part of one analyst's time to support and enhance the system. Furthermore, the system is written in PL/1, a language that is not supported by the City. The result is that when problems occur or changes are required, there is usually no or limited resources available to help the users.

The Library has defined its needs on several occasions, but the City has developed a poor record in providing service. During our review, we found service requests that were a year old. Problems that regularly disrupt public service have been outstanding for nine months (e.g., Appendix C, project 8.02 - Circulation - Reliability).

We discussed the DOBIS system with its developers in Germany. They indicated that two fulltime systems personnel are required to maintain the existing system properly and to install the remaining modules and upgrades. They also advised us that full implementation of DOBIS could require the equivalent of a dedicated IBM 4361 processor. This is a substantially larger machine than those currently installed at the City.

Like other departments, the Library has identified requirements for improved communications, office automation tools and local processing power. These needs are combined into the detailed requirements tables in Appendices A to C.



MANAGEMENT IMPLICATIONS

The next phase of this study will analyze the implications of our findings and develop a strategic plan for information systems within the HGG. There is, however, one observation that can be offered regarding systems development.

Systems Development Considerations

During our tabulation of the requirements lists we were impressed by the number of potential projects that appear to have a common or shared focus. Approximately 78% of all systems identified were requested by at least two of the major HGG members. This high number of systems that would be used by more than one group will have a significant impact on your systems development resources. Corporate and integrated database systems are typically more complex than the systems currently in place within HGG (the major exceptions being MSA and DOBIS). Design, development and ongoing support of systems that must meet different users' needs will stretch the abilities of your most talented systems professionals and demand substantial retraining of others.

Moving to a more modern systems environment will also change the mix of skills that will be required. In the next chapter of this report (under the heading "Staffing and Structure of the Systems Departments") we identify six groups of skills that do not currently exist in the HGG. As described, these skills will be crucial to your future success and generally cannot be "home grown".

SUMMARY

HGG is at an important stage in the life cycle of its systems facilities. There are pending requirements that will require major upgrades to your hardware and software development capabilities. Many of your existing systems are approaching the replacement point. One of the keys to your ability to overcome the challenges and capitalize on the opportunities will be the development and acceptance of an integrated technology strategy for all HGG departments. The second key will be how well each of your three organizations work together and individually to address the management and technical issues discussed in the next chapter. Proactive, empathetic and strong leadership will be required.



CHAPTER 3

TECHNICAL AND MANAGEMENT ISSUES REVIEW



3 - TECHNICAL AND MANAGEMENT ISSUES REVIEW

This section of the report presents our findings and conclusions on technical and management issues associated with development of information systems and their delivery. The issues studied were specified by the Engagement Steering Committee.

In preparing this chapter, we have addressed the issues for each organization individually. Where appropriate, we have also included an overall opinion on each issue. Because the Library is essentially a "user" of the City's services rather than a provider of system services, it has been excluded from this review. The Regional Transportation Department, which includes the former Transit (HSR) data centre, is considered a separate entity for the purposes of this review, because of the unique funding arrangements and user/developer relationships associated with its systems.

Our review of these issues is, by its nature, critical and does not address the many accomplishments the Regional and Hamilton City systems groups have achieved over the years. In our opinion, the Hamilton Government Group has a good foundation of human and computing resources on which it can build for the future. What is required now is leadership, new tools and a well-defined long-range system strategy to address the issues raised in this chapter and to rationalize the project backlog identified by your users.

THE ISSUES

The issues identified for review are as follows:

- **Service Levels** - What is the current level of service provided to users of the HGG data processing facilities? Is the service level adequate?
- **Long-Range Planning for Systems** - Do long-range plans exist for the use of automation within each organization?
- **Staffing and Structure of the Systems Departments** - Are the departments structured and staffed for optimum effectiveness and responsiveness to users' needs?
- **Cost of Service and User Fees** - Are chargeback systems in place to equitably allocate the cost of providing systems services on a user fee basis?



- **Security Issues** - Are appropriate measures in place to protect against accidental or deliberate misuse or destruction of equipment, networks, applications and data?
- **Systems Development Methodology** - Are computer systems designed, developed and maintained in accordance with reasonable methods and standards?

We discuss our findings and conclusions on each of these issues below.

Service Levels

It is difficult to measure service levels objectively within the context of the HGG because no formal performance standards exist for either systems development or operations functions. The exceptions to this general finding are certain operational systems such as payroll and welfare assistance which must be produced in accordance with rigidly enforced schedules.

Our findings on this issue are based more on perceptions obtained during interviews with technical and user personnel than on objective measures. We therefore offer them as observations rather than firm conclusions.

The Region

The Region's data processing group is seen by its users (primarily the Finance Department) as enthusiastic and willing to help, but functionally and technically limited and overloaded with work. Because most of the group's time has been devoted to the Finance Department and word-processing activities, it was not possible to arrive at an assessment of their performance in other areas.

We are therefore unable to offer an opinion on the service rating or performance potential of the Region's Data Processing group.

The City

The City's Systems and Data Processing Division has been providing systems and operations services to a variety of users since 1968. The environment in which they operate is technically complex. The demand for service appears to outstrip the group's capacity in terms of volume and skills.

We interviewed a number of users who were completely satisfied with the service they were receiving. Unfortunately, these users were in the minority. When praise was



offered, it was generally directed at the efforts of individual analysts or programmers rather than the efforts of the Division.

The City's Systems and Data Processing Division is perceived by many of its clients to be inefficient, lacking a sense of urgency and operating without the benefit of either a long-range plan or consistent direction.

We observed a number of instances where requests for systems maintenance or assistance with a problem had gone unserved for excessive periods of time. On the other hand, we also observed instances where users were upset about the level of service they were receiving without any apparent justification. During our interviews, the systems staff were always well prepared and appeared eager to assist in completion of the engagement.

Some of the Division's problems seem to be the result of the reputation that it has developed during the past ten years. Others are caused by the structure, staffing, systems development and management techniques employed on projects.

In our opinion, a substantial overhaul of the systems group will be required if it is to overcome the image that has developed and become a more effective, professional-services organization.

Long-Range Planning For Systems

Long-range systems planning is designed to assist organizations achieve their goals through the use of automated tools and information management techniques. A long-range systems plan usually addresses a five year period.

Long-range plans will typically begin with an outline of the overall system goals visualized by the organization, described in broad terms such as:

"..... within five years we want all major systems to be integrated and accessible by online terminals...."

These "visions" or goals will be refined to address specific objectives such as the need to update current equipment configurations:

".....Our existing mainframe will have to be upgraded to accommodate additional communications terminals..."

The objectives are refined to address specific short-term strategies, such as replacing existing applications or installing micro-based networks. The strategy statements are refined to produce short-term tactics, which themselves are refined to produce specific projects -- each with a detailed plan, budget and schedule.



This is a highly simplified description of the planning process. Each of the steps, however, is necessary in the evolution of a successful systems support operation. If steps are omitted, the result is confusion, lack of commitment among both users and systems professionals, and unnecessarily expensive, ineffective automation.

The Region

The Region has established a systems steering committee known as REMIC. REMIC is composed of representatives of various regional departments that use automated support systems. In addition to providing a forum for exchange of systems ideas and sharing of plans, REMIC also advises the Region on priorities for developing information systems and acquiring computing equipment.

Each year, REMIC solicits systems plans from all Regional departments and assesses them using a priority-setting algorithm. The resulting lists represent the system plans for the forthcoming year and, in general terms, for the three years to come.

Although this is a sound process, it could be improved in three areas:

- setting of long-range strategic direction,
- evaluation of resource requirements for prospective projects,
- responsiveness to "small" clients.

While REMIC projects focus on both short-term or individual divisional or departmental needs and longer-term corporate systems, such as personnel or payroll that address all departments, we found it difficult to grasp the overall direction the Region wishes to take with automated systems from our review of REMIC reports and priority lists. Without a clear long-range direction, REMIC is subject to short-term pressures that can divert the organization from pursuing some more strategic and time-consuming initiatives. We understand that REMIC members are concerned about the setting priorities.

The second area that needs improvement is the definition and sizing of prospective projects. Our review of the 1985/6 priority list identified a number of projects which are scheduled to start within the period, but which would appear to exceed the development capabilities of the Region. In developing priority lists, it is as important to determine what can be achieved as it is to determine what should be done. Otherwise, the priority-setting and scheduling process will lose credibility among user departments that are left waiting for service.

Finally, we believe that the Region's smaller departments may not receive the same degree of consideration as larger users when the priorities are being set. This is partly the result of REMIC's necessary focus on corporate initiatives, but also because smaller departments may lack the internal expertise to identify opportunities for improvement of their operations through the use of automation. To resolve this issue, the Systems Division, with REMIC's



support, must take the initiative in seeking out new clients. We recognize the contradiction between this comment and previous observations concerning the Systems group's workload.

In our opinion, REMIC is an excellent mechanism for achieving the Region's systems goals. It could be more effective if it carried out its priority-setting within the context of a formal long-range plan and if the three issues discussed above were addressed.

Transportation Department

The Transportation Department of the Region operates its own data processing function as the result of a provincial government program to automate urban transit systems. The long-range plan for information systems evolved out of a systems architecture designed to integrate all major operational and administrative aspects of the transit function. The Department's system plans support its own organizational objectives for both the long- and short-term, and are well defined and rationalized.

The major issue to be resolved is the reconciliation of Transit support systems with the Regional equivalents. For example, there is a Transit purchasing and payables system that partly duplicates facilities available at the Region. Although it would be possible to cancel development or abandon duplicated systems, it must be remembered that the Transit system has been developed within the context of a long-range plan and architecture. Eliminating individual parts will significantly affect the efficiency of the overall design.

The challenge is how to integrate Regional and Transit systems without introducing excessive duplication or destroying the integrity of either system.

The City

While individual system managers have documented plans for certain committed projects, plus ideas for longer term initiatives, we were unable to find evidence of a formal long-range systems planning process or a documented long-range systems plan. Nor does the City have a coordinating body such as REMIC to assist in developing and rationalizing systems plans.

In the early years, there were fairly clear goals and objectives for the City's systems group. These essentially addressed efforts to automate Hamilton's major corporate systems (ie. tax, general ledger, payroll, etc.). When the Region was formed, it became a major user of City resources. The Library added to the workload when it acquired the DOBIS system on the City's advice.

For the past ten years, the City's Systems and Data Processing Division appears to have been essentially a service bureau that has reacted to user demands rather than looking outward or forward. There are exceptions, such as the systems recently developed for the Fire Department, but on the whole, there is little evidence of systems initiatives being



taken. Although it could be argued that the introduction of the PROFS system and microcomputers is indicative of forward planning, we believe that these initiatives have been more a reaction to user pressures than part of an overall automation strategy.

As an example, the strategy would identify not just the user requirements, but the software development strategy, the hardware and personnel resources, networks and data bases, organizational, training/support and policy changes required to support effectively the significant investments that have been made in corporate systems and will be made in integrated office systems.

Staffing and Structure of Systems Departments

Our overall opinion on this issue is that neither of the major HGG systems groups is presently structured or adequately staffed to support the diverse requirements of their user departments.

The Region

At the time our study was conducted, the systems section at the Region consisted of seven personnel whose duties were described as follows:

- Manager of Information Systems - vacant
 - Systems Analyst - project management and planning
 - Systems Analyst - technical support
 - Programmer/Analyst - computer programming and operations
 - Operator/Programmer - 30% operations, 70% programming
 - Operator/Trainer - word processing training
 - Co-op Student - operations assistant.

When compared to the City's systems group, one might conclude that the Region is understaffed. However, the Region has taken a different approach to the organization and use of systems professionals. The Region uses external systems development personnel, hired on a contract basis for developing some of its systems. Others are developed and supported by personnel at the City. The Planning Department and Transit have both developed analysis and programming expertise to meet their own specialized requirements and can, for the most part, be considered self-sufficient. Therefore, it is not easy to compare the number of staff of the two departments.

We found one of the benefits of this distributed approach to systems support is that both Departments displayed a high degree of commitment, ownership and pride in their accomplishments.



The long-range support of the growing number of automated systems operating in Regional departments poses a substantial challenge. The Region's dependence on the City of Hamilton's systems group for general systems support has not proven to be an effective alternative. We do not believe that reliance on contracted development groups represents an effective solution because of the difficulties associated with enforcing standards and maintaining externally developed systems. The Region faces two major challenges in managing distributed systems and resources: enforcing standards, and coordinating the development of corporate and departmental projects between the central and user system groups (e.g., avoiding the departmental development of accounting systems that should be developed as a corporate initiative).

In our opinion, there are currently not enough staff in this Division to service the Region effectively. The present staff is too heavily weighted towards word processing, other office systems (i.e., personal computers), and operational support to be considered a general data processing support group. A significant investment in systems personnel will be required if the major systems now identified on the REMIC priority list are to be tackled in the stated timeframes.

THE CITY

The City's central Systems and Data Processing Division is bigger than the Region's because of the number of users, applications, and the scope of the systems the Division supports.

At the time of our review, the City's Systems and Data Processing Division had a complement of 43 personnel, excluding secretarial staff. The duties or classifications of the personnel were as follows:

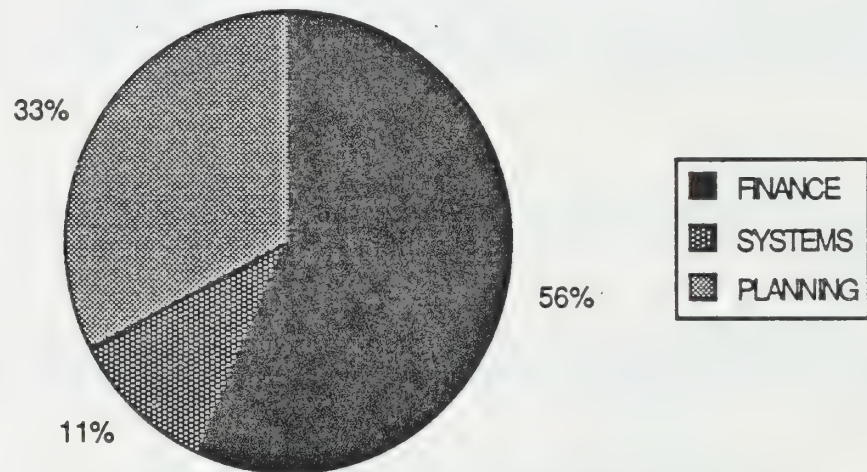
- Director of Systems and Data Processing (currently vacant)
 - Manager of Systems Development
 - Analysts (8)
 - Manager of Programming
 - Programmers I (5)
 - Programmers II (10)
 - Manager of Data Centre
 - Assistant Manager of Data Centre
 - Console Operators (5)
 - Unit Record Operator (1)
 - Key Punch Operators (6)
 - Supervisor of Microfilming
 - Microfilm Technicians (2)

There is a clear delineation of responsibilities at the City. The operations, systems and programming groups each operate as relatively autonomous entities. Although the previous Director acted as the coordinator of their activities, there is evidence that his

EXHIBIT 3-1

DISTRIBUTION OF USE OF THE REGIONAL WANG-VS DATA PROCESSING SYSTEM

REGIONAL WANG-VS





success in this regard was limited. We found, for example, that while the Director met with his managers individually, the management team rarely met as a group to establish plans or to resolve internal or external problems. Group meetings were infrequent and apparently did not result often in constructive action or agreement.

In our opinion, rigid enforcement of organizational boundaries within the City's Systems and Data Processing Division is a direct cause of some of the group's current difficulties.

Within the systems group, each analyst is responsible for servicing one or more user departments or functions (financial, payroll/personnel, fire, etc.) and is the back-up analyst for other departments or systems. This method of organization and staff assignment encourages the development of **functional specialists**. When a user department requirement is identified, the analyst performs the initial analysis and "sponsors" the proposed system through the approval process. If approved, the same analyst completes the final design and manages the implementation process. There is generally no direct contact between the users and the programmers.

Functional specialists have been successfully used in many environments. This approach represents the best method of servicing user needs in a centrally controlled organization.

There are several **key success factors** missing in the City's systems function. To be effective, especially in organizations with many opportunities for sharing systems and data, the group must operate within the framework of an overall plan and systems architecture. There should be a uniform set of design and project management standards. There should be close interaction between all participants in projects, including programming and operations personnel, systems and user department managers.

We believe that there are enough general systems personnel in the Division to service the needs of its clients. In our opinion, however, it will be necessary to add a number of highly skilled specialists to the Division in future years. The additional skill sets required include:

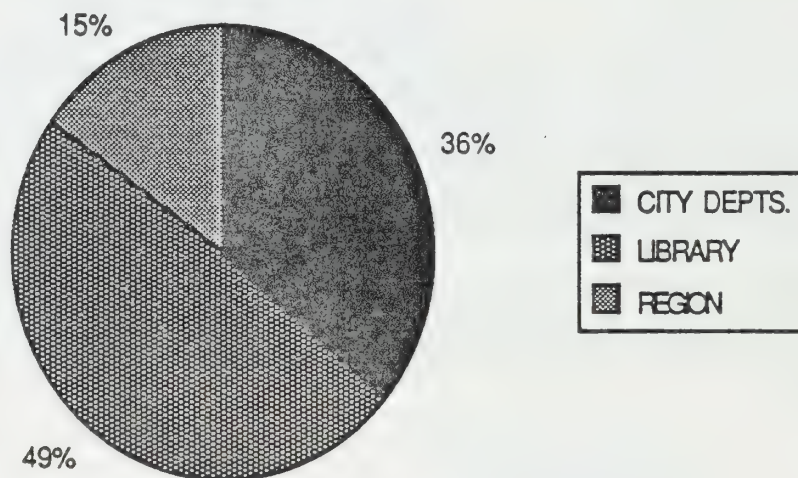
- systems architecture
- data management
- data communications
- capacity planning and performance tuning
- integrated office technology
- systems security planning and administration.

Based on our experience, it is normally impractical to attempt to turn general application analysts or functional specialists into these highly specialized personnel. It may also be impractical to assume that these skills can be acquired from external suppliers on a contract basis over the long term. **People with the necessary skills will have to be hired as full-time employees for some, if not most, of these positions.**

EXHIBIT 3-2

DISTRIBUTION OF USE OF THE CITY'S SYSTEMS AND DATA PROCESSING RESOURCES

HAMILTON DATA CENTRE





Cost of Services and User Fees

It is difficult to provide an evaluation of the existing methods of charging users for use of the HGG information processing facilities. Several systems are currently in place and they appear to be inconsistently applied.

The Region

At the time of our study, the Region was planning to introduce a chargeback system for use of the Wang word and data processing facilities. Exhibit 3-1, opposite, depicts the approximate distribution of users of the Wang VS computer based on disk use. The Finance Department is the prime user of the of the Region's Wang-based systems. The new chargeback system will distribute approximately 33% of the system's current costs to the Planning Department based on current system utilization. The remaining 67% of the resources are primarily used by Finance and Systems functions, and the costs are therefore not subject to direct reallocation.

If other departments start using the Wang equipment to any extent, there will be a stronger incentive to allocate costs accurately on a user-pay basis.

The City

The City's policy is that data processing is a corporate service that is to be provided without charge to all City departments. The policy includes computer terminals, microcomputers, systems development personnel and mainframe utilization.

In the case of non-City users such as the Region, a fee based on anticipated use of resources is negotiated each year and charged as the expenses are incurred. The Library is charged for the terminal devices located on its premises, the disk devices allocated to its files, and part of an analyst's salary costs. The Region is charged a resource-based cost with an annual maximum. The charges do not cover the actual cost of the services provided to either the Library or the Region.

Exhibit 3-2, overleaf, depicts the total resource utilization by the three major users of the City's data processing facilities, based mainly on computer use. The data was extracted from the Division's internal accounting system for the five-month period beginning January 1985. The distribution depicts the use, not the capacity, of the City's resources.

The costs currently being allocated to users of the City's facilities are less than the cost of providing the services. We understand that the rates for systems personnel and computer usage are currently under review and that, in some cases, significant increases are being proposed. We reviewed the proposed billing structure and conclude that, although it will result in increased costs to some users, it will not result in an equitable method of



recovering costs. Some users are concerned that the rates are not competitive now with other available alternatives (e.g., service bureaux and minicomputers with packages).

The issue of charging for systems and data processing services is extremely complex. If the MIC is implemented and funded through a user-pay system as proposed, there will be significant increases in the data processing expenditures of all departments. Satisfactory resolution of the chargeback issue is crucial to sharing information systems resources. The issue must be analyzed and a strategy developed in the next phase of this study.

Security Issues

Security issues relate to protection of the system-related assets of the HGG against accidental or deliberate misuse or destruction. Security planning must include:

- access controls to computer equipment, communications facilities, application programs and data files,
- provision of backup processing to ensure continuity in the event of a major disruption of normal data centre operations,
- participation by internal and external auditors in the design and approval of all information systems with financial implications.

Each of the organizations we reviewed has taken basic steps to protect their major processing facilities against unauthorized physical access or destruction by fire. Each organization has also taken preliminary steps to identify alternate processing sites that could be used in the event of a prolonged system failure.

None of the organizations has completed a formal disaster recovery plan or risk analysis. No alternative processing arrangements have been tested. Like most organizations who have never had to use an external backup facility in a disaster, no formal off-site processing agreements had been signed at the time of our review. A formal reciprocal agreement is necessary if management is to have any assurance that the backup facility will be available when required, and if the restrictions and limitations of the external facility are to be known (e.g., the backup site may not have enough processing power or communications capabilities to support key online applications such as the Library's circulation system)

There are no formal standards for program or data security on the microcomputers currently being installed. There is no formally designated manager responsible for the security, reliability and integrity of the main computer systems. Security standards are not enforced during the systems design or development cycle.



In summary, security has not received appropriate priority in any of the HGG facilities. In the event of a major systems interruption, there are no arrangements in place to ensure continuity of processing.

Systems Development Methodology

In our experience, no single element is more important to the successful operation of an information systems division than a formal systems development methodology. Neither the Region nor the City uses a formal methodology.

The Region

As previously described, the Region uses external groups to develop most of its information systems. Its analysts attempt to manage the projects, but the extent of their control is limited to scheduling and acceptance of the tested deliverables.

At the time of our review, there were no standards in place at the Region to control the movement of a new system through the various phases of the systems development life cycle. Nor were formal design, programming, or documentation standards in place. The Director of Finance recently published an outline of the items that must be included in a predevelopment documentation package.

These items, which include data file descriptions, report layouts etc., are important elements in the design process. They are not a substitute for either a development methodology or programming standards.

The City

The City has a document that outlines the phases that a project must go through as it is developed. The document represents a reasonably good overview of an orderly development process; however, it contains limited detail on how to conduct the various phases, modify the process based on the size of the project, responsibilities of users and system professionals, and what the deliverables and control points are in each phase. During our review, we determined that the process is not generally followed by the analysts or enforced by management.

The City has a published programming standards manual. The manual is obsolete and needs to be updated in light of new development techniques (e.g., prototyping) and technologies (e.g., personal computing, online systems, etc.).

Our overall opinion is that neither the Region nor the City has adopted the tools and techniques required to ensure that information systems are developed effectively.



Regardless of the future organization or staffing of the MIC, it is essential that all systems be developed in accordance with formal standards and within the framework of a comprehensive systems development and project management methodology. It has been demonstrated in many organizations that installation of these tools significantly increases productivity, reduces ongoing maintenance costs, and results in more functional information systems.

THE NEXT PHASE - THE ROAD MAP

The requirements identified by your users exceed the current available resources. Some would argue that the easiest way to overcome this shortfall in resources is to share the development effort through a central group. However, shared projects pose their own challenges (e.g., the Library's need for systems support and expanded use of computer resources). Others would argue that technology can address the shortfall in resources (e.g., encourage the use of end-user computing with fourth generation languages, report writing/screen generator software and micro-based productivity packages).

Distributed projects, such as those in Transportation and Planning, appear to be effective and tend to support the push for users having more control over systems activities. These departmental systems pose other concerns: the need to share their data bases quickly and easily with external users on a common network, and the need to coordinate the development efforts of user departments to avoid duplication and incompatible systems.

In short, there are no simple and obvious solutions that work effectively.

In this chapter of the report, we have presented our observations and opinions on service levels, planning, organization, staffing and skills, cost of service and user fees, security, and systems development methods. These issues in large measure determine the effectiveness of the HGG systems functions, and resolving the identified problems will result in improved performance, user satisfaction and the morale of the systems professionals in HGG.

More importantly, the success of the strategy study in the next phase and its implementation will depend on how well these issues are resolved. Furthermore, these issues must be resolved before any amalgamation of resources can or will proceed **with the support of your various users.**

Clearly a road map for the future evolution of systems (i.e., a comprehensive, documented strategy) is essential. It will help guide each of your organizations, departments, and many users as well as systems professionals, as you become even more dependent on integrated online networks and shared data bases, and as end-users gain more computing power of their own.



A long-range systems plan and strategy will include not only a list of projects ranked according to priority, but also:

- an organization strategy for the systems functions (both central and distributed) and training plans for system professionals and users,
- a strategy for the development of new policies, procedures and standards to establish the utility infrastructure, and coordinate and direct the system professionals as well as users,
- a resource strategy for hardware, system software and networks including a capacity plan based on the approved systems projects, and
- a budget for the current year and longer-term planning cycle.

With the strong trends towards departmental distributed computing and end-user personal computing, large organizations are developing strategies and support infrastructures to make information and computing power as quick and easy to use as electricity and home appliances. Like a public electrical utility, the future information utility or utilities of the HGG will not just happen. It must be planned and documented. The information utility you should be creating will involve the requisite data bases, networks, workstations, support and control infrastructures to aid users, as well as the upgraded hardware and corporate systems that are supported by your central systems groups. This utility concept and its management principles will evolve as your users become more demanding and the decreasing cost of technology promotes increased automation.

Regardless of whether or not the MIC is established, a systems strategy embracing these elements is necessary to help you focus your individual and shared efforts.



APPENDIX A
PRIMARY CHARACTERISTICS OF PROJECTS



APPENDIX A - PRIMARY CHARACTERISTICS OF PROJECTS

In this appendix, Exhibit A.1, after page A.2, lists the 133 projects that your users identified in the course of two separate series of workshops and the individual departmental interviews. We have rationalized the requirements list to simplify the presentation and reduce redundant projects. For example, we have listed statistical packages and report/screen generators only once, even though they were mentioned numerous times in our interviews and several times in the functional workshops. The list does not include systems that are installed, unless they require significant enhancements or replacement in the near future.

We have developed some preliminary classifications of the primary and secondary characteristics of the application requirements. They will assist you and the consultant in scoping out the requirements and developing the various architectures for the software, hardware, network and data bases. This appendix deals with the primary traits of the application requirements, including:

- the application class,
- the sponsoring organization(s) that want this system,
- the potential host computer on which the system could run,
- the overall potential scope of the system.

CLASSIFICATION METHODS AND CODES

The classification method and the codes used in the requirements lists are as follows:

- **Organization** - the first three columns identify the sponsoring organizations who want this requirement. The three sub-heading codes represent your respective organizations (C = City, R = Region, L = Library). Under these sub-headings, we show the degree of common interest in the application by means of the following codes:
 - A = all three organizations
 - a two-letter code means two organizations are interested (e.g., CR = City and Region)
 - a single character means only one organization wants the system (e.g., L = Library)
- **Host** - is the likely host processor on which this system could run. Because there is a multiplicity of systems alternatives in the HGG, more than one choice is often flagged. The strategy phase will



refine the selection of the eventual host computer(s). The various codes and sub headings mean:

- M/F = Mainframe (e.g., City's IBM 4300)
 - Mini = Minicomputer (e.g., Region's VAX or Wang systems)
 - PC = Personal or microcomputer.
- **Scope** - the applications have been coded according to the potential impact and interest that each project will have for your respective organizations:
 - CORP = any project that was identified by more than two separate departments as a high priority.
 - DEPT = any project ranked by one or two departments as a high priority.
 - PER = are personal applications that pertain mainly to individual tasks (e.g., word processing).

In certain cases, a requirement can have multiple classifications depending on the degree to which the system or application will affect the organization and your various departments (see class 9.00 - Integrated Office Systems).

- **Mode**- describes the type of processing required for the application (O = online, B = Batch or both).

Appendix B contains other secondary classifications that can be helpful in the second phase.

EXHIBIT A.1 - PRIMARY CHARACTERISTICS OF SYSTEMS PROJECTS

PAGE 1/6

APPLIC. NUMBER	APPLICATION NAME	ORGANIZATION C R L	--- M/F	HOST MINI	--- PC	--- CORP	SCOPE DEPT	--- PER	MODE O B
=====	=====								
1.00	HUMAN RESOURCE SYSTEMS								
=====	=====								
1.01	BENEFITS REPORTING	A A	M/F				DEPT		O B
1.02	EMPLOYEE DEVELOPMENT TRACKING	A A	M/F				DEPT		O B
1.03	EMPLOYEE JOB HISTORY	A A	M/F				DEPT		O B
1.04	POSITION COMPLEMENT CONTROL	A A	M/F				DEPT		O B
1.05	APPLICANT FLOW/TRACKING	CR CR	M/F				DEPT		O B
1.06	INJURY/ACCIDENT REPORTING	CR CR	M/F				DEPT		O B
1.07	LABOUR RELATIONS	CR CR	M/F				DEPT		O B
1.08	ONLINE PERSONNEL INQUIRY	A A	M/F				DEPT		O B
1.09	REPORT/SCREEN GENERATOR	CR CR	M/F				DEPT		O B
1.10	PAYROLL SUBSYSTEM REWRITE	CR CR	M/F			CORP			O B
1.11	DIRECT BANK DEPOSIT	CR CR	M/F			CORP			O B
1.12	RECORD OF EMPLOYMENT REPORTING	CR CR	M/F				DEPT		O B
1.13	LABOUR DISTRIBUTION	CR CR	M/F				DEPT		O B
1.14	WORKMENS COMPENSATION REPORTS	CR CR	M/F			CORP			O B
1.15	ATTENDANCE COSTING	A A	M/F				DEPT		O B
=====	=====								
2.00	PROPERTY BASED SYSTEMS								
=====	=====								
2.01	COMPLAINT/INSPECTION/ORDER TRACKING	CR CR	M/F	MINI			CORP		O B
2.02	TAXATION REWRITE	CR CR	M/F				CORP		O B
2.03	PROPERTY ACQUISITION CONTROL	CR CR	M/F	MINI			CORP		O B
2.04	APPLICATION/PERMIT TRACKING	CR CR	M/F				CORP		O B
2.05	PROPERTY PROFILE/LAND USE DATA BASE	CR CR	M/F	MINI			CORP		O B
2.06	ASSESSMENT MONITORING/TRACKING	CR CR	M/F	MINI			CORP		O B
2.07	ENCROACHMENTS	CR CR	M/F	MINI			CORP		O B
2.08	LAND RELATED INFORMATION SYSTEM	CR CR	M/F	MINI			CORP		O B
2.09	GEO-CODED MAPPING SYSTEMS	CR CR	M/F	MINI			CORP		O B
2.10	ROAD /STREETS NEEDS/INVENTORY	CR CR	M/F	MINI			CORP		O B

EXHIBIT A.1 - PRIMARY CHARACTERISTICS OF SYSTEMS PROJECTS

PAGE 2/6

APPLIC. NUMBER	APPLICATION NAME	ORGANIZATION C R L	--- M/F	HOST MINI	--- PC	--- CORP	SCOPE DEPT	--- PER	MODE O B
3.00	OPERATIONS MANAGEMENT SYSTEMS								
3.01	INVENTORY/PURCHASING/BILLING	OR	M/F	MINI		CORP			O B
3.02	FLEET MANAGEMENT/BILLING	OR	M/F	MINI		CORP			O B
3.03	ONLINE MMS PAYROLL/BILLING	OR	M/F	MINI		CORP			O B
3.04	CAPITAL SUBSIDY PROGRAM MGMT	OR	M/F	MINI		CORP			O B
3.05	SEWER/WATER MAINTENANCE	OR	M/F	MINI			DEPT		O B
3.06	REPORT/SCREEN GENERATOR	OR	M/F	MINI			DEPT		O B
3.07	FLEET MAINTENANCE/SCHEDULER	OR	M/F	MINI		CORP			O B
4.00	ADMINISTRATIVE/PUBLIC SERVICE								
4.01	ELECTIONS MANAGEMENT	CL	M/F				DEPT		O B
4.02	ONLINE BYLAW INQUIRY	A	M/F			CORP			O
4.03	CIVIC LAW ONLINE CROSS REFERENCE	OR	M/F	MINI	PC		DEPT		O
4.04	FACILITIES MANAGEMENT	RL	M/F	MINI			DEPT		O B
4.05	PUBLIC EVENTS CALENDAR	RL	M/F	MINI		CORP			O B
4.06	ONLINE MAILING SYSTEM	A	M/F	MINI	PC	CORP			O
4.07	COMMUNITY QUERY SYSTEM	A	M/F	MINI		CORP			O
4.08	MESSAGING/ELECTRONIC MAIL	A	M/F		PC	CORP			O
4.09	CALENDARING/SCHEDULING	A	M/F	MINI		CORP			O
4.10	TEXT/GRAPHICS INTEGRATION	A	M/F	MINI	PC	CORP			O
5.00	COMMUNITY SERVICE SYSTEMS								
5.01	BUDGET/FINANCIAL ACCOUNTING SYSTEM	OR	M/F	MINI	PC	CORP			O B
5.02	CLIENT PROFILE ANALYSIS	OR	M/F	MINI		CORP			O B
5.03	CASE PLANNING/MANAGEMENT	OR	M/F	MINI		CORP			O B

EXHIBIT A.1 - PRIMARY CHARACTERISTICS OF SYSTEMS PROJECTS

PAGE 3/6

APPLIC. NUMBER	APPLICATION NAME	ORGANIZATION C R L	--- M/F	HOST MINI	--- PC	--- CORP	SCOPE DEPT	--- PER	MODE O B
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
5.00	COMMUNITY SERVICE SYSTEMS (cont.)								
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
5.04	TRUST ACCOUNTING	CR CR	M/F	MINI	PC	CORP	DEPT		O B
5.05	PATIENT CARE-PHARMACY, DIETARY	R		MINI	PC		DEPT		O B
5.06	PATIENT CARE-AD/MEDICAL RECORDS	R		MINI	PC		DEPT		O B
5.07	SERVICES FOR THE ELDERLY	R		MINI	PC		DEPT		O B
5.08	SERVICES FOR THE ELDERLY	R		MINI	PC		DEPT		O B
5.09	NURSE/STAFF SCHEDULING	R		MINI	PC		DEPT		O B
5.10	LODGE RECORD KEEPING	R		MINI	PC		DEPT		O B
5.11	PROGRAM BUDGETING	CR CR	M/F	MINI	PC	CORP			O B
5.12	PERFORMANCE MEASMT. & EVALN.	CR CR	M/F	MINI	PC	CORP			O B
5.13	COMPREHENSIVE INCOME MAINTENANCE SYSTEM	CR CR	M/F	MINI	PC	CORP			O B
5.14	FOLLOWUP SYSTEM	CR CR	M/F	MINI	PC	CORP			O B
5.15	AR OVERPAYMENT SYSTEM	CR CR	M/F	MINI	PC	CORP			O B
5.16	SERVICES/CONTACT DIRECTORY	CR CR	M/F	MINI		CORP			O
5.17	EMERGENCY SERVICES DIRECTORY	CR CR	M/F	MINI		CORP			O
5.18	FORECASTING/MODELLING SYSTEM	CR CR	M/F	MINI		CORP			O B
5.19	REFERRAL SERVICE/BILLING SYSTEM	CR CR	M/F	MINI		CORP			O B
5.20	HANDICAP PARKING PERMIT SYSTEM	CR CR	M/F	MINI	PC		DEPT		O B
5.21	SOCIAL SERVICES CATALOG & INDEX	CR CR	M/F	MINI	PC				O B
5.22	TELIDON MIN EDUC CAREER GUIDANCE	CR CR	M/F	MINI		CORP	DEPT		O B
5.23	MEDICAL STUDENT CASE INDEX	CR CR	M/F	MINI		CORP			O B
5.24	EMPLOYER INDEX	CR CR	M/F	MINI		CORP			O B
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
6.00	FINANCIAL SYSTEMS								
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
6.01	CAPITAL BUDGETING	A A A	M/F	MINI	PC	CORP			O B
6.02	CURRENT BUDGETING	A A A	M/F	MINI	PC	CORP			O B
6.03	MULTI-LEVEL BUDGETING	A A A	M/F	MINI	PC	CORP			O B
6.04	CHARGE BACK JOURNAL SYSTEM	A A A	M/F	MINI			DEPT		B

EXHIBIT A.1 - PRIMARY CHARACTERISTICS OF SYSTEMS PROJECTS

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APPLIC. NUMBER	APPLICATION NAME	ORGANIZATION C R L	--- M/F	HOST MINI	--- PC	--- CORP	SOOPE DEPT	--- PER	MODE O B
6.00	FINANCIAL SYSTEMS (cont.)								
6.05	ONLINE ENCUMBRANCE ACCOUNTING	A A	M/F	MINI		CORP			O
6.06	VARIANCE REPORTING SYSTEM	A A	M/F	MINI		CORP			B
6.07	DEBENTURE MANAGEMENT SYSTEM	A A	M/F	MINI	PC		DEPT		B
6.08	FINANCE POLICY/PROCEDURE INQUIRY	A A	M/F	MINI		CORP			O
6.09	FACILITY ASSET MANAGEMENT	A A	M/F	MINI	PC	CORP			O
6.10	PROPERTY MANAGEMENT SYSTEM	A A	M/F	MINI	PC	CORP			O
6.11	ENCROACHMENTS SYSTEM	A A	M/F	MINI			DEPT		O
6.12	INTEGRATED ACCOUNTS PAYABLE	A A	M/F	MINI		CORP			O
6.13	CASH MANAGEMENT SYSTEM	A A	M/F	MINI	PC	CORP			O
6.14	PENSION REWRITE	A A	M/F	MINI			DEPT		O
6.15	ACCOMPLISHMENT/PERFORMANCE SYSTEM	A R		MINI		CORP			O
6.16	JOB COSTING SYSTEM	R		MINI		CORP			O
6.17	ELECTRONIC CASH REGISTERS	A A			PC		DEPT		B
6.18	METERED WATER SYSTEM REWRITE	A A	M/F	MINI	PC		DEPT		O
6.19	SECURITIES MANAGEMENT SYSTEM	A A	M/F	MINI	PC		DEPT		O
6.20	SUBSIDY MANAGEMENT SYSTEM	A A	M/F	MINI	PC		DEPT		O
6.21	EQUIPMENT ASSET MANAGEMENT	A A	M/F	MINI	PC	CORP			O
7.00	SYSTEMS DEVELOPMENT TOOLS/AIDS								
7.01	RESOURCE/CAPACITY PLANNING SYS.	A A			PC		DEPT		B
7.02	CHARGEBACK ACCOUNTING SYSTEM	A A	M/F		PC		DEPT		B
7.03	DATA BASE STANDARDS	A A	M/F			CORP			O
7.04	FOURTH GENERATION LANGUAGE	A A	M/F		PC	CORP	DEPT	PER	O
7.05	LOCAL AREA NETWORK	A A	M/F	MINI		CORP	DEPT	PER	O
7.06	DSS/GRAPHICS PACKAGE	A A	M/F		PC	CORP	DEPT	PER	O
7.07	COMPUTER BASED TRAINING SYSTEMS	A A	M/F		PC	CORP			O

EXHIBIT A.1 - PRIMARY CHARACTERISTICS OF SYSTEMS PROJECTS

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APPLIC. NUMBER	APPLICATION NAME	ORGANIZATION C R L	--- M/F	HOST MINI	--- PC	--- CORP	SCOPE DEPT	--- PER	MODE O B
====	=====								
8.00	LIBRARY SYSTEMS								
====	=====								
8.01	ODOC TO DOBIS	L	M/F			CORP			O B
8.02	CIRCULATION-RELIABILITY	L	M/F			CORP			O
8.03	CIRCULATION-PORTABLE SCANNER	L	M/F			CORP			O
8.04	CIRCULATION-DEWEY LIST	L	M/F			CORP			O
8.05	CIRCULATION-PATRON CARDS	L	M/F			CORP			O
8.06	CATALOGUING-UTLAS/DOBIS	L	M/F			CORP			O
8.07	CATALOGUING-UNIV//ALBERTA AUTH.	L	M/F			CORP			O
8.08	CATALOGUING-RECORD CREATION	L	M/F			CORP			O
8.09	ACQUISITIONS-ONLINE	L	M/F			CORP			O
8.10	ACQUISITION-ELECTRONIC ORDERING	L	M/F		PC	CORP			O
8.11	ACQUISITIONS-FUND ACCOUNTING	L	M/F			CORP			O
8.12	ACQUISITIONS-SERIALS CONTROL	L	M/F			CORP			O
8.13	PUBLIC ACCESS-PUBLIC TERMINALS	L	M/F			CORP			O
8.14	PUBLIC ACCESS-INTEGR. CATALOGUE	L	M/F			CORP			O
8.15	PUBLIC ACCESS-EXTENDED HOURS	L	M/F			CORP			O
8.16	PUBLIC ACCESS-FASTER ACCESS	L	M/F			CORP			O
8.17	GOVERNMENT DOCUMENTS	L	M/F			CORP	DEPT		O
8.18	QWQCQWOC	L	M/F						O
====	=====								
9.00	INTEGRATED OFFICE SYSTEMS (IOS)								
====	=====								
9.01	IOS WORD PROCESSING	A	M/F	MINI	PC	CORP	DEPT	PER	O
9.02	IOS-EDITABLE DOCUMENT EXCHANGE (DCADIA)	A	M/F	MINI	PC	CORP	DEPT	PER	O
9.03	IOS-PC INTERFACE TO WORD PROCESSORS	A	M/F	MINI	PC	CORP	DEPT	PER	O
9.04	IOS-GRAPHICS/TEXT INTEGRATION	A	M/F	MINI	PC	CORP	DEPT	PER	O
9.05	IOS-LASER PRINTER INTERFACE	A	M/F	MINI	PC	CORP	DEPT	PER	O
9.06	IOS-COMMUNICATIONS TO TYPESETTER	A	M/F	MINI	PC	CORP	DEPT	PER	O B
9.07	IOS-ELECTRONIC MAIL/MESSAGING	A	M/F	MINI	PC	CORP	DEPT	PER	O

EXHIBIT A.1 - PRIMARY CHARACTERISTICS OF SYSTEMS PROJECTS

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APPLIC. NUMBER	APPLICATION NAME	ORGANIZATION C R L	--- M/F	HOST MINI	--- PC	--- CORP	SCOPE DEPT	--- PER	MODE O B
9.00	INTEGRATED OFFICE SYSTEMS (cont.)								
9.08	IOS-PERSONAL CALENDARING	A A	M/F	MINI	PC	CORP	DEPT	PER	O
9.09	IOS-FACILITY SCHEDULING/BOOKING	A A	M/F	MINI	PC	CORP	DEPT	PER	O
9.10	IOS-COMPUTER OUTPUT MICROFILM (COM)	A A	M/F	MINI	PC	CORP	DEPT	PER	O B
9.11	IOS-DIG. CLASSIFICATION/RETRIEVAL	A A	M/F	MINI	PC	CORP	DEPT	PER	O
9.12	IOS-END USER PERSONAL COMPUTING	A A	M/F	MINI	PC	CORP	DEPT	PER	O B
9.13	IOS-PUBLIC DATA BASES	A A	M/F	MINI	PC	CORP	DEPT	PER	O
9.14	IOS-REPORT/SCREEN GENERATOR	A A	M/F	MINI	PC	CORP	DEPT	PER	O B
9.15	IOS-STATISCAL PACKAGE	A A	M/F	MINI	PC	CORP	DEPT	PER	O B
9.16	IOS-FOLLOWUP/POST DATE SYSTEM	A A	M/F	MINI	PC	CORP	DEPT	PER	O
9.17	IOS-PROJECT MANAGEMENT SYSTEM	A A	M/F	MINI	PC	CORP	DEPT	PER	O
10.00	MISCELLANEOUS DEPARTMENTAL SYSTEMS								
10.01	COMPUTER AIDED DISPATCH	CR CR	M/F			CORP			O
10.02	INCIDENT STATISTICS	C	M/F				DEPT		O B
10.03	HAZARDOUS MATERIALS	C	M/F	MINI		CORP	DEPT		O
10.04	TICKET RESERVATION SYSTEM	C	M/F	MINI			DEPT		O B



APPENDIX B
SECONDARY CHARACTERISTICS OF PROJECTS



APPENDIX B - SECONDARY CHARACTERISTICS OF PROJECTS

In this appendix, Exhibit B.1, overleaf, highlights secondary characteristics of your various projects. We have not reviewed these classifications with any experienced users or systems professionals, nor are we planning to in this phase. This material will need to be critiqued by each organization before it can be used as background to any strategy analysis.

CLASSIFICATION METHOD AND CODES

This preliminary analysis looks at your requirements from three additional perspectives - potential benefits, possible development strategies and opportunities to use common information systems (I.S.) resources:

- **Benefits** - under four sub-headings, we outline the possible benefits for each project that could result from a properly designed and implemented system. The four codes are:
 - P = productivity savings
 - S = service benefits to users or the public
 - D = information for decision making
 - O = other (legislative, public health/safety).
- **Build/Buy** - under these two sub-headings (where C = custom development and P = package purchase), we identify the likely development strategy option(s).
- **Common I.S. Resources** - we have projected under five categories where each project may be able to share common I.S. resources, including:
 - H = hardware
 - S = software
 - N = network
 - P = people
 - D = data bases.

The strategy development phase will look at these issues in more detail for each project. This material will form some of the background for the discussion and analysis in that phase.

EXHIBIT B.1 - SECONDARY CHARACTERISTICS OF SYSTEM PROJECTS

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APPLIC. NUMBER	APPLICATION NAME	---	BENEFITS			---	BUILD/BUY			-COMMON I.S. RESOURCES-				
			P	S	D	O	C	P		H	S	N	P	D
=====														
1.00	HUMAN RESOURCE SYSTEMS													
=====														
1.01	BENEFITS REPORTING	P	S	D		O		P		H	S	N	P	D
1.02	EMPLOYEE DEVELOPMENT TRACKING	P		D				P		H	S	N	P	D
1.03	EMPLOYEE JOB HISTORY	P		D				P		H	S	N	P	D
1.04	POSITION COMPLEMENT CONTROL	P		D				P		H	S	N	P	D
1.05	APPLICANT FLOW TRACKING	P		D				P		H	S	N	P	D
1.06	INJURY/ACCIDENT REPORTING	P		D				P		H	S	N	P	D
1.07	LABOUR RELATIONS	P		D				P		H	S	N	P	D
1.08	ONLINE PERSONNEL INQUIRY	P	S	D				P		H	S	N	P	D
1.09	REPORT/SCREEN GENERATOR	P	S	D				P		H	S	N	P	D
1.10	PAYROLL SUBSYSTEM REWRITE	P		D				P		H	S	N	P	D
1.11	DIRECT BANK DEPOSIT	P	S	D				P		H	S	N	P	D
1.12	RECORD OF EMPLOYMENT REPORTING	P						P		H	S	N	P	D
1.13	LABOUR DISTRIBUTION	P		D				P		H	S	N	P	D
1.14	WORKMENS COMPENSATION REPORTS	P	S	D				P		H	S	N	P	D
1.15	ATTENDANCE COSTING	P						P		H	S	N	P	D
=====														
2.00	PROPERTY BASED SYSTEMS													
=====														
2.01	COMPLAINT/INSPECTION ORDER TRACKING	P	S	D		O		C		H	S	N		D
2.02	TAXATION REWRITE	P	S	D		O		C		H	S	N		D
2.03	PROPERTY ACQUISITION CONTROL	P	S	D				C		H	S	N	P	D
2.04	APPLICATION/PERMIT TRACKING	P		D		O		C		H	S	N	P	D
2.05	PROPERTY PROFILE/LAND USE DATA BASE	P	S	D		O		C	P	H	S	N	P	D
2.06	ASSESSMENT MONITORING/TRACKING	P	S			O		C		H		N		D
2.07	ENCROACHMENTS	P	S			O		C		H		N		D
2.08	LAND RELATED INFORMATION SYSTEM	P	S	D		O		C	P	H	S	N	P	D
2.09	GEO-CODED MAPPING SYSTEMS	P	S	D		O		P		H	S	N	P	D
2.10	ROAD /STREETS NEEDS/INVENTORY	P	S	D		O		C		H	S	N	P	D

EXHIBIT B.1 - SECONDARY CHARACTERISTICS OF SYSTEM PROJECTS

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APPLIC. NUMBER	APPLICATION NAME	--- P	--- S	D	--- O	BUILD/BUY C P	H	S	N	P	D
3.00	OPERATIONS MANAGEMENT SYSTEMS										
3.01	INVENTORY/PURCHASING/BILLING	P	S	D		C	H	S	N	P	D
3.02	FLEET MANAGEMENT/BILLING	P	S	D		C	H	S	N	P	D
3.03	ONLINE MMS PAYROLL / BILLING	P	S			C	H	S	N	P	D
3.04	CAPITAL SUBSIDY PROGRAM MGMT	P	S	D	O	C	H	S	N	P	D
3.05	SEWER WATER MAINTENANCE	P	S	D		C	H	S	N		D
3.06	REPORT/SCREEN GENERATOR	P	S	D		P	H	S	N		D
3.07	FLEET MAINTENANCE/SCHEDULER	P	S	D		C	H	S	N	P	
4.00	ADMINISTRATIVE/PUBLIC SERVICE										
4.01	ELECTIONS MANAGEMENT	P	S		O	C			N		D
4.02	ONLINE BYLAW INQUIRY	P	S	D	O		H	S	N		D
4.03	CMV LAW/ONLINE CROSS REFERENCE	P	S	D	O	P		S			D
4.04	FACILITIES MANAGEMENT	P	S	D		C	H	S	N		D
4.05	PUBLIC EVENTS CALENDAR						H	S	N		D
4.06	ONLINE MAILING SYSTEM	P	S			P	H	S	N		D
4.07	COMMUNITY QUERY SYSTEM					C	H	S	N		D
4.08	MESSAGING/ELECTRONIC MAIL	P	S			P	H	S	N		D
4.09	CALENDARING/SCHEDULING	P	S			P	H	S			D
4.10	TEXT/GRAPHICS INTEGRATION	P	S			P	H	S	N		D
5.00	COMMUNITY SERVICE SYSTEMS										
5.01	BUDGET/FINANCIAL ACCOUNTING SYSTEM	P	S	D		P	H	S	N	P	D
5.02	CLIENT PROFILE ANALYSIS	P	S	D		C	H	S	N		D
5.03	CASE PLANNING/MANAGEMENT	P	S	D		C	H	S	N		D

EXHIBIT B.1 - SECONDARY CHARACTERISTICS OF SYSTEM PROJECTS

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APPLIC. NUMBER	APPLICATION NAME	---	P	S	D	---	BUILD/BUY	---	H	S	N	P	D
							C						
5.00	COMMUNITY SERVICE SYSTEMS (cont.)												
5.04	TRUST ACCOUNTING	P	S	D	O		P		H	S	N		D
5.05	PATIENT CARE-PHARMACY, DIETARY	P	S	D	O		P			S			
5.06	PATIENT CARE-ADT/MEDICAL RECORDS	P	S	D	O		P			S			
5.07	SERVICES FOR THE ELDERLY	P	S	D			P		H				
5.08	SERVICES FOR THE ELDERLY	P	S	D			P		H				
5.09	NURSE/STAFF SCHEDULING	P	S	D	O		P			S			
5.10	LODGE RECORD KEEPING	P	S	D			P	C	H	S			
5.11	PROGRAM BUDGETING	P	S	D			P	C	H	S	N	P	D
5.12	PERFORMANCE MEASMT. & EVALN.	P	S	D			P	C	H	S	N		D
5.13	COMPREHENSIVE INCOME MAINTENANCE SYSTEM	P	S	D	O		P	C	H	S	N		D
5.14	FOLLOWUP SYSTEM	P	S	D			P		H	S	N		D
5.15	A/R OVERPAYMENT SYSTEM	P	S	D			P	C	H	S	N		D
5.16	SERVICES/CONTACT DIRECTORY	P	S	D			P		H	S	N		D
5.17	EMERGENCY SERVICES DIRECTORY	P	S	D			P		H	S	N		D
5.18	FORECASTING/MODELLING SYSTEM	P	S	D			P		H	S	N	P	D
5.19	REFERRAL SERVICE/BILLING SYSTEM	P	S	D			P	C	H	S	N		D
5.20	HANDICAP PARKING PERMIT SYSTEM	P	S	D			P	C	H	S	N		D
5.21	SOCIAL SERVICES CATALOG & INDEX	P	S	D			P		H	S	N		D
5.22	TELIDON MIN EDUC CAREER GUIDANCE	P	S	D			P		H				
5.23	MEDICAL STUDENT CASE INDEX	P	S	D			P	C	H	S	N		D
5.24	EMPLOYER INDEX	P	S	D			P	C	H	S	N		D
6.00	FINANCIAL SYSTEMS												
6.01	CAPITAL BUDGETING	P	S	D			P		H	S	N	P	D
6.02	CURRENT BUDGETING	P	S	D			P		H	S	N	P	D
6.03	MULTI-LEVEL BUDGETING	P	S	D			P		H	S	N	P	D
6.04	CHARGE BACK JOURNAL SYSTEM	P	S	D			P		H	S	N	P	D

EXHIBIT B.1 - SECONDARY CHARACTERISTICS OF SYSTEM PROJECTS

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APPLIC. NUMBER	APPLICATION NAME	BENEFITS			BUILD/BUY			-COMMON U.S. RESOURCES-						
		P	S	D	---	C	P	H	S	N	P	D		
=====	=====													
6.00	FINANCIAL SYSTEMS (cont.)													
=====	=====													
6.05	ONLINE ENVOYANCE ACCOUNTING	P	S	D			P	H	S	N	P	D		
6.06	VARIANCE REPORTING SYSTEM	P	S	D		C		H	S	N		D		
6.07	DEBENTURE MANAGEMENT SYSTEM	P	S	D			P	H	S	N	P	D		
6.08	FINANCE POLICY/PROCEDURE INQUIRY	P	S				P	H	S	N		D		
6.09	FACILITY ASSET MANAGEMENT	P	S	D			P	H	S	N	P	D		
6.10	PROPERTY MANAGEMENT SYSTEM	P	S	D			P	H	S	N	P	D		
6.11	ENCROACHMENTS SYSTEM	P	S	D			P	H	S	N	P	D		
6.12	INTEGRATED ACCOUNTS PAYABLE	P	S				P	H	S	N	P	D		
6.13	CASH MANAGEMENT SYSTEM	P	S	D			P		S	N	P	D		
6.14	PENSION REWRITE	P	S	D			P	H	S	N	P	D		
6.15	ACCOMPLISHMENT/PERFORMANCE SYSTEM	P	S	D			P	H		N		D		
6.16	JOB COSTING SYSTEM	P	S	D			P	H		N		D		
6.17	ELECTRONIC CASH REGISTERS	P					P	H	S	N	P	D		
6.18	METERED WATER SYSTEM REWRITE	P	S	D		C	P			N		D		
6.19	SECURITIES MANAGEMENT SYSTEM	P	S	D		C	P			N		D		
6.20	SUBSIDY MANAGEMENT SYSTEM	P	S	D		C	P			N		D		
6.21	EQUIPMENT ASSET MANAGEMENT	P	S	D			P	H	S	N	P	D		
=====	=====													
7.00	SYSTEMS DEVELOPMENT TOOLS/AIDS													
=====	=====													
7.01	RESOURCE/CAPACITY PLANNING SYS.	P		D		C	P							
7.02	CHARGEBACK ACCOUNTING SYSTEM	P				C	P							
7.03	DATA BASE STANDARDS	P					P	H	S	N	P	D		
7.04	FOURTH GENERATION LANGUAGE	P	S				P	H	S	N		D		
7.05	LOCAL AREA NETWORK	P	S				P	H	S	N		D		
7.06	DSS/GRAPHICS PACKAGE	P					P	H				D		
7.07	COMPUTER BASED TRAINING SYSTEMS	P					P				P			

EXHIBIT B.1 - SECONDARY CHARACTERISTICS OF SYSTEM PROJECTS

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APPLIC. NUMBER	APPLICATION NAME	BENEFITS			BUILD/BUY			COMMON I.S. RESOURCES				
		P	S	D	O	C	P	H	S	N	P	D
====	=====											
8.00	LIBRARY SYSTEMS											
====	=====											
8.01	CODOC TO DOBIS	P	S			C	P	H	S	N	P	D
8.02	CIRCULATION-RELIABILITY	P	S				P	H	S	N	P	D
8.03	CIRCULATION-PORTABLE SCANNER	P	S				P	H	S	N	P	D
8.04	CIRCULATION-DEWEY LIST	P	S				P	H	S	N	P	D
8.05	CIRCULATION-PATRON CARDS	P	S				P	H	S	N	P	D
8.06	CATALOGUING-UTLAS/DOBIS	P	S				P	H	S	N	P	D
8.07	CATALOGUING-UNIV/ALBERTA AUTH.	P	S				P	H	S	N	P	D
8.08	CATALOGUING-RECORD CREATION	P	S				P	H	S	N	P	D
8.09	ACQUISITIONS-ONLINE	P	S	D			P	H	S	N	P	D
8.10	ACQUISITION-ELECTRONIC ORDERING	P	S	D			P	H	S	N	P	D
8.11	ACQUISITIONS-FUND ACCOUNTING	P	S	D			P	H	S	N	P	D
8.12	ACQUISITIONS-SERIALS CONTROL	P	S	D			P	H	S	N	P	D
8.13	PUBLIC ACCESS-PUBLIC TERMINALS	P	S				P	H	S	N	P	D
8.14	PUBLIC ACCESS-INTEGR. CATALOGUE	P	S				P	H	S	N	P	D
8.15	PUBLIC ACCESS-EXTENDED HOURS	P	S				P	H	S	N	P	D
8.16	PUBLIC ACCESS-FASTER ACCESS	P	S				P	H	S	N	P	D
8.17	GOVERNMENT DOCUMENTS	P	S				P	H	S	N	P	D
8.18	QWIC/QWOC	P	S	D			P	H	S	N	P	D
====	=====											
9.00	INTEGRATED OFFICE SYSTEMS (IOS)											
====	=====											
9.01	IOS-WORD PROCESSING	P	S				P	H	S	N		D
9.02	IOS-EDITABLE DOCUMENT EXCHANGE (DCADIA)	P	S				P	H	S	N		D
9.03	IOS-PC INTERFACE TO WORD PROCESSORS	P	S				P	H	S	N		D
9.04	IOS-GRAPHICS/TEXT INTEGRATION	P	S				P	H	S	N		D
9.05	IOS-LASER PRINTER INTERFACE	P	S				P	H	S	N		D
9.06	IOS-COMMUNICATIONS TO TYPESETTER	P	S				P	H	S	N		D
9.07	IOS-ELECTRONIC MAIL/MESSAGING	P	S				P	H	S	N		D

EXHIBIT B.1 - SECONDARY CHARACTERISTICS OF SYSTEM PROJECTS

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APPLIC. NUMBER	APPLICATION NAME	---	P	S	D	O	---	BUILD/BUY C P	H	S	N	P	D
-----	-----	---	P	S	D	O	---	C P	H	S	N	P	D
=====	=====	---					---						
9.00	INTEGRATED OFFICE SYSTEMS (cont.)	---					---						
=====	=====	---					---						
9.08	IOS-PERSONAL CALENDARING	P	S	D				P	H	S	N		D
9.09	IOS-FACILITY SCHEDULING/BOOKING	P	S	D				P	H	S	N		D
9.10	IOS-COMPUTER OUTPUT MICROFILM (COM)	P	S					P	H	S	N		
9.11	IOS-DOC. CLASSIFICATION/RETRIEVAL	P	S	D				P	H	S	N	P	D
9.12	IOS-END USER PERSONAL COMPUTING	P	S	D			C	P	H	S	N		D
9.13	IOS-PUBLIC DATA BASES	P	S	D				P	H		N		
9.14	IOS-REPORT/SCREEN GENERATOR	P	S	D				P	H	S	N	P	D
9.15	IOS-STATISCAL PACKAGE	P	S	D				P	H	S	N	P	D
9.16	IOS-FOLLOWUP/POST DATE SYSTEM	P	S	D				P	H	S	N	P	D
9.17	IOS-PROJECT MANAGEMENT SYSTEM	P	S	D				P	H	S	N	P	D
=====	=====	---					---						
10.00	MISCELLANEOUS DEPARTMENTAL SYSTEMS	---					---						
=====	=====	---					---						
10.01	COMPUTER AIDED DISPATCH	P	S	D	O			C	H		N		D
10.02	INCIDENT STATISTICS	P	S	D				C	H		N		D
10.03	HAZARDOUS MATERIALS	P	S	D	O			C	H		N		D
10.04	TICKET RESERVATION SYSTEM	P	S					P					



APPENDIX C

PROJECT DESCRIPTIONS



APPENDIX C

SYSTEM PROJECT DESCRIPTIONS

The project descriptions shown in this appendix correspond to the application names shown in Appendices A and B. We have tried as much as possible to maintain consistency with the functional workshop descriptions developed by J. Hindson. In the cases where we have identified other projects (e.g., Library Systems), we have developed our own descriptions.

1.00 - HUMAN RESOURCE SYSTEMS

1.01 - Benefits Reporting

The extended recording and reporting of employee benefits including the generation of a comprehensive employee benefits statement.

1.02 - Employee Development Tracking

The recordkeeping of employee education, training and skills information for career path and workforce utilization purposes.

1.03 - Employee Job History

The retention of pertinent information on each employee for the purposes of meeting governmental and historical employee reporting requirements.

1.04 - Position/Complement Control

The maintenance of an inventory of the status of all positions within the organization.



1.05 - Applicant Flow/Tracking

The compilation and organization of information obtained from job applicants for selection and control purposes.

1.06 - Injury/Accident Recording

The recordkeeping of all work-related injuries and accidents, including the monitoring of employees exposed to toxic chemicals or other hazardous substances.

1.07 - Labour Relations

The recording and reporting on events that relate to negotiated union contracts; such as tracking seniority, reporting on grievance and arbitration results and disciplinary actions, etc.

1.08 - Online Personnel Inquiry

Extend user access capability to users who have a demonstrated need for access to information online.

1.09 - Report/Screen Generator

Provide users with the capability of designing and generating ad hoc reports or access screens based on information available in machine-readable form.

1.10 - Payroll Subsystem Rewrite

Rewrite all payroll subsystems that are driven by the Payroll Master.



1.11 - Direct Bank Deposit

Implement direct deposit banking.

1.12 - Record of Employment Reporting

Produce the Canadian Record of Employment for terminated employees as required by Canada Employment and Immigration.

1.13 - Labour Distribution

Implement labour distribution reporting at the activity, program, or project level.

1.14 - Attendance Costing

A cost reporting system for all absence types inclusive of long term disability.

2.00 - PROPERTY-BASED SYSTEMS

2.01 - Complaints/Inspections/Orders and Tracking

Transactions related to inspections, complaints, orders and follow-up status for properties and businesses.

2.02 - Taxation Rewrite

Rewrite of the Business and Realty Tax systems.



2.03 - Property Acquisition and Control

Up-to-date information on properties that have been acquired for municipal purposes including property description, use, rental or lease information, maintenance expenses and profit/loss statement.

2.04 - Applications/Permits Tracking

Recording and tracking of the status of building, planning or other application and permit systems. Generate further action documents as may be required.

2.05 - Property Profile/Land Use Data Base

The recording of information concerning a property including location, physical attributes, survey information, zoning, assessment, land-use nearest fire hydrant location, etc.

2.06 - Assessment Monitoring/Tracking

Assist with the identification of new or additional taxation revenue sources through the monitoring and reporting of changes to properties or property uses that would result in a change in assessed value.

2.07 - Encroachments

To record encroachments on Municipal property and interface rental or lease payments and changes in rates with Accounts Receivable.

2.08 - Land-Related Information System

An information system based on the geographic identification of features (geo-coding).



2.09 - Geo-Coded Mapping systems

A multi-use graphics display and plotting system designed to generate maps of geo-coded LRIS data (see 2.08 above) for a variety of purposes including planning, engineering, legal, public safety, utilities, etc.

2.10 - Road/Streets Needs/Inventory

An update of the existing streets inventory system.

3.00 - OPERATIONS MANAGEMENT SYSTEMS

3.01 - Inventory/Purchasing/Billing Management

An inventory system including EOQ, MRP information, notification to reorder, tracking of purchase orders and invoicing for material released from inventory. Interfaces needed with other Department inventories.

3.02 - Fleet Management/Invoicing

The management of maintenance services performed on vehicle fleets including the recording, analysis and monitoring of preventive maintenance services, fleet acquisition, maintenance operations, depreciation costs and revenue generated. Include profit/loss statement at vehicle level.

3.03 - On-line MMS Payroll/Billing

Enhancements to the existing Maintenance Management Systems to eliminate the multiple recording of employee labour hours for payroll purposes.



3.04 - Capital Subsidy Program Management

Management of the Capital Subsidy Program to optimize the utilization of Provincial Government subsidy funds and make immediate adjustments to programs or projects in response to funding availability.

3.05 - Sewer/Water Maintenance Records

Maintenance records and monitoring of maintenance activities for the sewer and water distribution system.

3.06 - Report/Screen Generator

Provide users with the capability of designing and generating ad hoc reports or access screens based on information available in machine-readable form.

3.07 - Fleet Maintenance/Scheduler

Enhancements to the Fleet management systems to coordinate the preventive maintenance requirements with vehicle operating schedules.

4.00 - ADMINISTRATIVE/PUBLIC SERVICE SYSTEMS

4.01 - Elections Management

To assist with the administration of information and procedures for conducting Municipal Elections.

4.02 - Online Bylaw Text

The online access to Bylaw text information for the most frequently accessed Municipal bylaws and bylaw schedules.



4.3 - Civil Law Online Cross Reference

An online data base of civil law precedent cross references.

4.04 - Facilities Management

To manage the bookings, scheduling of support services, billings and statistical reporting information requirements for rented Municipal facilities including profit/loss statements.

4.05 - Public Events Calendar

Online access to, and update capability for a Calendar of events and programs scheduled to occur within the Municipality for internal and public queries (e.g., tourism).

4.06 - Online Mailing System

The ability to generate and update mailing lists originating from a Department or extracted from data files with the purpose of "targeting" specific contact industries, businesses or persons.

4.07 - Community Query System

The ability to obtain the answers to common requests for information or information concerning Associations, Agencies or contact persons in the community (e.g., to support elected officials, community information centres, libraries).

4.08 - Messaging and Scheduling

The electronic transmission of messages and the scheduling of meetings.



4.09 - Calendaring/Scheduling

The ability to schedule meetings with personnel and plan personal calendars online.

4.10 - Text and Graphics Integration

The integration of text and graphic information.

5.00 - COMMUNITY SERVICE SYSTEMS

5.01 - Budget/Financial Accounting System

More current encumbrance reporting and the implementation of year-end forecasting models(s).

5.02 - Client Profile Analysis

Profiles and statistical reporting for clients.

5.03 - Case Development Plan/Management

Case profiles including plan, objectives, development, review and follow-up.

5.04 - Trust Accounting

The control and accounting of patient funds held in trust.

5.05 - Patient Care - Pharmacy, Dietary

A system to record and process orders for ancillary services in nursing homes for such items as medication and meals.



5.06 - Patient Care - ADT/Medical Records

A system for handling admission/discharge/transfers (ADT) and medical records of diagnosis and treatment programs for nursing home patients.

5.07 and 5.08 - Services for the Elderly

A system to assist in ordering services (e.g., meals-on-wheels) and keeping records for elderly citizens involved in home care programs. (Note: 5.08 is a duplicate of 5.07 to represent the various types of services which may be required (e.g., VON, etc.).

5.09 - Nurse/Staff Scheduling

A system to assist in scheduling nursing and support staff to minimize labour costs and labour contract violations.

5.10 - Lodge Recordkeeping

A system to manage the financial and administrative records of the lodge.

5.11 - Program Budgeting

A modelling system to assist program managers in developing financial budgets.

5.12 - Performance Measurement and Evaluation

A recording and reporting system to measure performance against department and program objectives.



5.13 - Comprehensive Income Maintenance System (CIMS)

Review of the impacts of, and the changes required to interface with the Provincial Comprehensive Income Maintenance System.

5.14 - Follow-up System

To automatically receive information concerning cases which require attention or follow-up actions at a specific time in the future.

5.15 - Accounts Receivable (Under/Overpayment)

An accounts receivable system to record and follow-up on the recovery of funds as the result of benefit overpayment.

5.16 - Service/Contact Directory

A directory of agencies and contact persons to which clients can be referred.

5.17 - Emergency Services Directory

A directory of emergency services, resources and contact persons for the delivery of necessary services in the event of a disaster.

5.18 - Forecasting/Modelling

Techniques and tools for forecasting and modelling the financial and human resource (caseloads) needed as the result of historical trend information or various funding scenarios.



5.19 - Referral Service/Billing System

Application referrals and billings for counselling services contracted out to outside agencies.

5.20 - Handicap Parking Permit System

The application, verification and annual issue and updating of handicapped parking permits.

5.21 - Social Services Catalogue and Index

A catalogue and index system for reference sources in the Social Service library as well as reports, journals available from other sources.

5.22 - Telidon Ministry of Education Career Guidance

The online Ministry of Education career guidance data base on Telidon for career counselling.

5.23 - Medical Student Case Index

An index system to match students with patients which have the specific medical histories the students wish to study.

5.24 - Employer Index

A cross-index of employers and the types of employment or industry to assist with employment referrals.



6.00 - FINANCIAL SYSTEMS

6.01 - Capital Budgetting

An automated and integrated information system for capital budget preparation, reporting, monitoring and forecasting.

6.02 - Current Budgetting

An automated and integrated information system for current budget preparation, reporting, monitoring and forecasting.

6.03 - Multi-Level Budgeting

Budgetting in higher levels of detail to enable user departments to budget on an activity, program or project level and aggregate information into an object-of-expenditure budget.

6.04 - Chargeback/Rendering System

Streamlined and timely information for handling inter-Departmental charges.

6.05 - Online Encumbrance Accounting

Immediate updating and processing of purchasing and accounting records plus the creation of user-formatted financial and budget statements.

6.06 - Variance Reporting System

To identify accounts that are not experiencing expenditures and/or revenues as planned.



6.07 - Debenture Management

The continuous control, monitoring and administration of debenture issues.

6.08 - Financial Policy/Procedure Inquiry

Maintenance and access to financial policies and procedures in machine-readable form.

6.09 - Fixed Assets Management System

The control and monitoring of all Corporate fixed assets.

6.10 - Property Management System

Management of Municipally-owned properties with respect to their purchase price, description, lease or rental income and operating expenses. profit/loss statement at the property level.

6.11 - Encroachments

The management of encroachments on municipal property including description, billing information and rates and integration with accounts payable.

6.12 - Integrated Accounts Payable

An online accounts payable system designed to integrate with the encumbrance accounting system (see 6.05) that processes purchase invoices, cheques and performs invoice matching to purchase orders.



6.13 - Cash Management System

Monitoring and analysis system to update cash-flow requirements for improved short term investment income.

6.14 - Pension Rewrite

Rewrite outdated and inadequate pension information system.

6.15 - Accomplishment/Performance System

A system to record and report on the accomplishment of departmental and program performance objectives.

6.16 - Job Costing

A system to record and report on operating job costs (e.g., repair orders) and multi-year capital construction projects.

6.17 - Electronic Cash Register

Point-of-transaction updating of accounts.

6.18 - Metered Water Rewrite

Rewrite of outdated and inadequate metered water billing system.

6.19 - Securities Management

The ongoing management and follow-up on the status of securities held by the Corporations in connection with local improvements (or related) activities.



6.20 - Subsidy Management System

The reporting, monitoring and analysis of projects, programs or activities eligible for subsidy with a view to optimizing subsidy revenues.

6.21 - Equipment Asset Management

A system to manage and report on the funding requirements, replacement cycle and inventory of physical assets (vehicles and equipment).

7.00 - SYSTEMS DEVELOPMENT

7.01 - Resource/Capacity Planning

A modelling and forecasting system to assist with Systems resource planning.

7.02 - Chargeback Accounting

A chargeback system for Systems and data processing services.

7.03 - Data Base Standards

A uniform standard or standards for databases used.

7.04 - Fourth Generation Languages

High-level languages (fourth generation) for the development of systems applications by system professionals, and other tools to aid users in accessing, manipulating and reporting from existing data bases or developing departmental systems.



7.05 - Networking Software

Appropriate software to integrate, control and monitor the network. Other software packages to support micro-based local area networks.

7.06 - Decision Support Software/Graphics

Graphics software integrated with decision support software (DSS) for user departments to assist with data analysis, decision-making and reports.

7.07 - Computer-Based Training Systems

The availability of training information and tutorials in a computer-based environment.

8.00 - LIBRARY SYSTEMS

8.01 - CODOC to DOBIS

The ability to access both DOBIS and CODOC files on the same terminal.

8.02 - Circulation - Reliability

Find and fix the bugs in the DOBIS software which causes the terminal network to be unreliable with certain types of transactions.

8.03 - Circulation - Portable Scanner

The purchase and implementation of new replacement portable scanners for the book mobiles to improve the reliability of check-in and check-out circulation functions.



8.04 - Circulation - Dewey List

A printout of the collection by Dewey number, by branch to enable the Library to perform collection analysis.

8.05 - Circulation - Patron Cards

The modifications to DOBIS so that the system will accept pre-labelled patron cards as opposed to having the system automatically assigned patron numbers as new records are created.

8.06 - Cataloguing - UTLAS/DOBIS

An online interface between DOBIS and UTLAS to eliminate the need for the weekly transfer of tape records between UTLAS and DOBIS.

8.07 - Cataloguing - Univ/Alberta Authorities

The ability to transfer authority records online using a program developed by the University of Alberta.

8.08 - Cataloguing - Record Creation

Expanded installation of terminals to assist cataloguing staff; consider relocating cataloguing staff with acquisitions to build catalogue entries at time of ordering; and cleanup of authority names and cataloguing of HPL original material.

8.09 - Acquisitions - Online

Implementation of the acquisitions module to allow for online ordering of new titles.



8.10 - Acquisitions - Electronic Ordering

A system to allow for electronic ordering of titles from book publishers and distributors.

8.11 - Acquisitions - Fund Accounting

A system to allow encumbrance fund accounting for book purchases.

8.12 - Acquisitions - Serials Control

A system to control the purchasing and renewals for serials (magazines).

8.13 - Public Access - Public Terminals

The system module in DOBIS that allows public access through public terminals either located within the library or remotely to off-load requests to the librarian on circulation and collections.

8.14 - Public Access - Integrated Catalogue

Modification to the sort sequences on catalogue entries to facilitate public access.

8.15 - Public Access - Extended Hours

The provision of extended processing hours outside of 9:00 a.m. to 5:00 p.m. to facilitate public access on a seven day a week/16 hour a day basis.

8.16 - Public Access - Faster Access

The ability to allow public to access municipal records in the FASTER System at City Hall.



8.17 - Government Documents

The cataloguing and retrieval of abstracts on government documents.

8.18 - KWIC/KWOC

The ability to retrieve documents by key work in context and key word out of context retrieval techniques.

9.00 - INTEGRATED OFFICE SYSTEMS (IOS)

9.01 - IOS - Word Processing

The expanded use of electronic work stations (either terminals or micro computers or word processors) and the creation of standards to ensure transfer ability of both staff and document files.

9.02 - IOS - Editable Document Exchange

A system to support the transmission of document files with the control codes for editing (e.g., bolding, underscoring, tabs, etc.) imbedded in the documents to allow for the exchange of editable document files between various users.

9.03 - IOS - Interface to Word Processors

A system to allow the exchange of document files between incompatible word processors (mainframe, micro, and stand alone word processors).

9.04 - IOS - Graphics/Text Integration

A system to support the integration of text and graphics easily within a document file.



9.05 - IOS - Laser Printer Interface

A system to support the transmission of document files to a laser printer to produce near-typeset letter quality for high-profile documents (bylaws, minutes and reports to council).

9.06 - IOS - Communications to Typesetters

A system to support the communication of galley proofs with editable control codes and graphics to typesetters.

9.06 - IOS - Electronic Mail/Messaging

A system to support the distribution of internal mail electronically and broadcast messaging to all electronic mail users.

9.08 - IOS - Personal Calendaring

A system to support the creation and maintenance of personal calendars and to allow for booking of group meetings.

9.09 - IOS - Facility Scheduling/Booking

A system to support the booking of key public facilities and meeting rooms.

9.10 - IOS - Computer Output Microfilm (COM)

A system to integrate document and data files to microfilming systems, to create the microfilm index and store it online on central systems.



9.11 - IOS - Document Classification/Retrieval

A system to classify electronic documents by key words and allow the retrieval of documents by key words.

9.12 - IOS - End User Personal Computing

Expanded use of microcomputers for end user personal computing and the setting of standards for personal computing software tools (spreadsheets, data file utilities, etc.).

9.13 - IOS - Public Data Bases

The procurement cataloguing and use of public data bases for end users.

9.14 - IOS - Report/Screen Generator

Software programs and data dictionaries to support the creation of ad hoc reports and enquiry screens by end users.

9.15 - IOS - Statistical Package

Software packages to support the statistical analysis of data bases located on mainframes, minicomputers and microcomputers.

9.16 - IOS - Followup/Post Date System

A system to allow for the creation of followup or post date reminders and the production of post date reports and reminder notices.



9.17 - IOS - Project Management System

A system to support the managing of project activities and resources as well as track progress.

10.00 - MISCELLANEOUS DEPARTMENTAL SYSTEMS

10.01 - Computer Aided Dispatch

A system to support the dispatch of emergency vehicles showing location of building and properties, routing, property uses, emergency facilities, ownership, etc.

10.02 - Incident Statistics

A system to record and report on emergency incidents, their cause and outcomes.

10.03 - Hazardous Materials

A system to track the location of hazardous materials for inspection, emergency and environmental purposes.

10.04 - Ticket Reservation System

A system to allow for the reservation of tickets for events at public facilities, plus perform the revenue accounting.

